No 48

Authority – Browns Directory of American Gas Companies Gas Statistics 1919. Progressive Age Publishing Co. 52 Vanderbilt Ave New York.
This embraces practically all the By Product Coke oven plants in U.S. and Canada shown in said Authority and being operated.

BY-PRODUCT COKE OVENS.

Owing to investments and location of Beehive oven plants they will only gradually decrease. otherwise the output would soon be wholly By-Product. When By-Product oven gas is in demand, Producer gas can readily be substituted for heating ovens thereby effecting very considerable economy.

In 1909 in the U.S. Beehive ovens produced 84·09% and By Product ovens 15·91% of the total coke production 39.305.015 Tons. In 1918 53·7% and 43·3% respectively of the total tonnage 56.670.000 Tons. Increase in Total coke Tonnage 1909-1918. 44·2%. Decrease in Beehive 8·1%. Increase in By-Product 319·9%.

For metallurgical purposes a higher grade of coke is required than for Domestic. In other words coals make Domestic coke which would not make metallurgical

Page	State or Country	Town or City	Name of Company	Capital including Bonds	Koppers Ovens						
					No. of Ovens	Size Length × Width × Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas	Candle Power
445	Alabama	Alabama City	Gulf States Steel Co	$11.000.000	37	37'×17"-19½"×9'10"	12·25	17	78	525	
"	"	Birmingham	Sloss Sheffield Steel & Iron Co	$20.000.000							
"	"	Ensley	Semet Solvay Co								
"	"	Fairfield	Tennessee Coal Iron & R.R. Coy	$6.772.000	280	37'8"×19'9"×9'10"	12·5				
"	"	Holt	Central Steel & Coal Coy.								
"	"	Woodward	Woodward Iron Coy		170	also 60 Wilputte ovens					
446	Colorado	Pueblo	The Colorado Fuel & Iron Coy.	$91.200.000	120	40'×18"×10'	13	18	67·6	587	
"	Illinois	Chicago	The By-Product Coke Corp.								
"	"	"	Wisconsin Steel Coy.	$1.000.000							
"	"	Joliet	Coal Products Manufacturing Coy.	$1.143.000	35	35'×18"×9'	also 18 Wilputte ovens				
"	"	"	Illinois Steel Coy	$18.500.000	280	35'×19"×8'9"	10·5				
447	"	Waukegan	North Shore Gas Coy.	$8.000.000							
"	Indiana	Gary	Illinois Steel Coy.		700	37'×19"×9'10⅜"	12·5				
"	"	Indiana Harbour	By Product Coke Corp.	$12.000.000							
"	"	"	Inland Steel Coy.	$36.000.000	130	37'×18½"-21"×9'10¾"	13·25	18	72	525	
"	"	Indianapolis	Citizens Gas Coy.	$12.000.000							
"	"	"	"	"							
448	"	Muncie	Central Indiana Gas Coy.	$8.500.000	22	19'×20"×7'	5	24	70	580	
"	"	Terra Haut.	Indiana Coke & Gas Coy.	$3.175.000	60	37'4⅙"×15"-17"×11'9¼"	13	17	65	525	
"	Kentucky	Ashland	Kentucky Solvay Coke Coy.	$5.200.000							
449	Maryland	Sparrows Point	Bethlehem Steel Coy.	$365.000.000	180	37'×18½"-21"×9'10⅜"	13·5	18	70		
"	Massachusetts	Boston.	New England Fuel & Transportation Coy	$25.000.000							
"	Michigan	Detroit	Detroit City Gas Coy.	$31.000.000							
"		"	Ford Motor Coy.								
"		"	Semet-Solvay Coy.								
"	Minnesota	Duluth.	Minnesota Steel Coy.		90						
450		"	Zenith Furnace Coy.	$1.500.000							
"		St. Paul.	Minnesota By-Product Coke Coy.	$3.000.000	65	39'6"×18¼"×9'10⅝"	12·25	17	72	530	14
"	Missouri	St Louis	Laclede Gas Light Coy	$28.000.000	56	37'6"×19½"×9'10"	13·25	18			
"	New Jersey	Camden	Camden Coke Coy.	$350.000.							
"	"	Jersey City	Seaboard By-Product Coke Coy.								
451	New York	Buffalo	Donner Union Coke Corp.		150	40'×15¾"-18¼"×10'	11·7	14	70	under construction	
"	"	"	Semet-Solvay Coy.								
"	"	Geneva	Empire Coke Coy.	$1.750.000							
"	"	Lackawanna	Lackawanna Steel Coy.	$56.900.000							
452	"	Syracuse	Semet-Solvay Coy.	$20.000.000							
"	Ohio	Canal Dover	Dover Coke & By-Product Coy.		24	41'×14"×13'7"	15	14	68	520	
"	"	Canton.	United Furnace Coy.	$2.500.000	47	37'×17"-19½"×9'10"	12·7	15	73	539	
"	"	Cleveland	American Steel & Wire Coy.	$90.000.000	180	37'×18¼"×9'10⅜"	12·5				
"	"	"	Cleveland Furnace Coy.								
453	"	"	Domestic Coke Corp.	$3.500.000							
"	"	"	McKinney Steel Coy.		204	37'×18¼"×9'10"	12·25	18	73	520	
"	"	Hamilton	Hamilton Otto Coke Coy.								
"	"	Ironton	Ironton Solvay Coke Coy.	$2.000.000.							
"	"	Lorain	National Tube Coy.	$9.797.000	208	37'×18"×9'10"	12·5				
"	"	Portsmouth	Portsmouth Solvay Coke Coy.	$3.500.000.							
454	"	Steubenville	La Belle Iron Works.	$12.500.000	94	37'6"×18¼"×9'10⅝"	12·53	17	72·78	574	
"	"	Toledo	Toledo Furnace Coy.	$7.300.000.	94	37'×17"-19½"×9'10"	12·5	16	73	527	
"	"	Youngstown.	Brier Hill Steel Coy.		84		12·25	17			
455	"	"	Youngstown Sheet & Tube Coy.	$30.000.000	306	39'6"×17"-19½"×9'10⅝"	12·25	18	68		
"	Pennsylvania	Chester	Philadelphia Suburban Gas & Electric Co								
"	"	Clairton.	Carnegie Steel Coy.		640	37'×18¼"×9'10⅜"	13				
"	"	Dunbar	Semet-Solvay Coy.								
"	"	Farrell	Carnegie Steel Coy.								
"	"	Johnstown.	Cambrai Steel Coy.								
456	"	Lebanon	Bethlehem Steel Coy.								
"	"	McKeesport.	Alleghany By-Product Coke Coy.								
"	"	Midland	Pittsburg Crucible Steel Coy.		100	underconstruction.					
"	"	Pittsburg	Jones & Laughlin Steel Coy.		300	under construction.					
"	"	South Bethlehem.	Lehigh Coke Coy.		362		13·75		75	500	
"	"	Steelton.	Bethlehem Steel Coy.								
"	"	Swedeland	Rainey Wood Coke Coy.		110	39'6"×17"×9'10⅝"	11·7	under construction.			
"	Rhode Island	Providence	Providence Gas Coy.		40	40'×17"×9'10"	11·4	15			
457	Tennessee	Chattanooga	Chattanooga Coke & Gas Coy.	$2.273.000							
"	Washington	Seattle	Seattle Lighting Coy.		20	27'×16'5"×7'11"	3·3	25	67	607	
"	West Virginia	Fairmount	Domestic Coke Corp.		60	37'×3'5¾"×11'7	under construction				
"	Wisconsin	Mayville	North Western Iron Coy.								
"	"	Milwaukee	Milwaukee Coke & Gas Coy.	$3.500.000.							
"	"										
			CANADA								
458	Nova Scotia	Sydney.	Dominion Iron & Steel Coy.	$20.640.000							
"	"	"	"	"	120	37'×17"×9'10"	11·3	18	69·5	615	
"	Ontario	Hamilton	The Steel Coy of Canada Ltd.	$25.000.000.	80	38'×16½"-19"×10'5"	12·6	18	76		Wilputte ovens
"	"	Sault Ste Marie	Algoma Steel Corp Ltd	$51.000.000	110	39'×17"-21"×9'10⅜"	12·85	19·5	70		
"	"	"	"	"	25	39'5"×18½"-21½"×9'10⅝"	12·85	19·5	70		Wilputte ovens
"	"		"								
			Totals		5470						
			% of the whole		48·1%						

Name of Company	Semet-Solvay Ovens							Otto Hoffman Ovens							Coals	
	No. of Ovens	Size Length × Width × Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas	Candle Power	No. of Ovens	Size Length × Width × Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas	Candle Power	High Volatile Percentage	Low Volatile Percentage
Gulf States Steel Co															18	82
Sloss Sheffield Steel & Iron Co	120	Under construction														
Semet Solvay Co	240	30'×16½"×4'9"-6'9"														
Tennessee Coal Iron & R.R. Coy																
Central Steel & Coal Coy.	60	35'×16½"-20"×8'2"														
Woodward Iron Coy																
The Colorado Fuel & Iron Coy.															100	
The By-Product Coke Corp.	280	36'×16½"-19½"×8'2"-9'9"														
Wisconsin Steel Coy.																
Coal Products Manufacturing Coy.																
Illinois Steel Coy																
North Shore Gas Coy.	13	20'×19"×9'	8·5	22	565	20										
Illinois Steel Coy.																
By Product Coke Corp.	120	36'×19½"×10'9½"	under construction.													
Inland Steel Coy.															70	30
Citizens Gas Coy.								100	7'9" long.	7·5	24		617	9		
"	41	36'×19½"×12'	15	24	80	579	8									
Central Indiana Gas Coy.															100	
Indiana Coke & Gas Coy.															90	10
Kentucky Solvay Coke Coy.	108	36'×21"×12'														
Bethlehem Steel Coy.															50	50
New England Fuel & Transportation Coy								400	33'×18"×6'					18		
Detroit City Gas Coy.	215															
Ford Motor Coy.	120	under construction.														
Semet-Solvay Coy.	215	30'-36'×16"-20"×8'2"-10'9"														
Minnesota Steel Coy.																
Zenith Furnace Coy.								65	33'×17½"×6'6"		20	70	450	16	100	
Minnesota By-Product Coke Coy.															80	20
Laclede Gas Light Coy																
Camden Coke Coy.								150								
Seaboard By-Product Coke Coy.								165	39'6"×18¼"×9'10⅝"	12·5	17	72	520	13·5	80	20
Donner Union Coke Corp.																
Semet-Solvay Coy.	60	36'×19½"×10'9"														
Empire Coke Coy.	46	35'×16"×7'4"-8'11"	84	21	72	590									50	50
Lackawanna Steel Coy.	60	under construction.						470	32'2¼"×15⅞"×6'4"							
Semet-Solvay Coy.	40	30'×16½"×6'7"														
Dover Coke & By-Product Coy.															100	
United Furnace Coy.															80	20
American Steel & Wire Coy.																
Cleveland Furnace Coy.	100	34'6"×16"-20"×8'2"														
Domestic Coke Corp.	60	under construction														
McKinney Steel Coy.															85	15
Hamilton Otto Coke Coy.								100		6·75	24	72	685	15	80	20
Ironton Solvay Coke Coy.	60	36'×21"×12'														
National Tube Coy.																
Portsmouth Solvay Coke Coy.	108	36'×21"×12'														
La Belle Iron Works.															85	15
Toledo Furnace Coy.															85	15
Brier Hill Steel Coy.															80	20
Youngstown Sheet & Tube Coy.																
Philadelphia Suburban Gas & Electric Co	40	30'×15"×8'	7·5	21	75	570	5									
Carnegie Steel Coy.	110	30'×16½"×4'9"-6'9"														
Semet-Solvay Coy.																
Carnegie Steel Coy.								212	43'9"×17¼"×7'	9·5						
Cambrai Steel Coy.								552	32'×17"-19"×6'10⅞"-9'10⅞"	9·7-12·5	21	70	520		30	70
Bethlehem Steel Coy.								229	33'×17"-22"×6'5"	6	34	70	600	17	67	33
Alleghany By-Product Coke Coy.								120	33'3"×16"×6'6"	6		72·5				
Pittsburg Crucible Steel Coy.																
Jones & Laughlin Steel Coy.																
Lehigh Coke Coy.																
Bethlehem Steel Coy.	120															
Rainey Wood Coke Coy.																
Providence Gas Coy.																
Chattanooga Coke & Gas Coy.	24		16	18	72	625	17									
Seattle Lighting Coy.																
Domestic Coke Corp.																
North Western Iron Coy.								108		9·12	19	75			71	29
Milwaukee Coke & Gas Coy.	160	35'×16½"×9'6"	9·99	13·5	82	610										
CANADA																
Dominion Iron & Steel Coy.								620	33'-34'×14"-17"×6'9"	5·5-9·4	26-38	66·7	615		100	
"																
The Steel Coy of Canada Ltd.																
Algoma Steel Corp Ltd															60	40
"															60	40
Totals	2520							3291	Wilputte ovens 105.	Otto United & Otto Hoffman are combined						
% of the whole	22·1%							28·9%	Wilpulte 0·9%							

Name of Company	By-Products									Coke Classification			Percentage of Gas used in heating Ovens	Tons of Coke per Oven per Annum	Cu feet of Gas per Ton of Coke	Remarks
	Coke in Tons	Tar in Gals.	Ammonia Sulphate in lbs.	Pure Benzol in gals	Pure Tuluol in gals.	Xylol in gals	Solvent Naphtha in gals	Naphthalene in Tons	Gas M. Cu. Ft.	Blast Furnace Tons	Breeze Tons	Other Purposes Tons				
Gulf States Steel Co	187.000	1.920.000.	5.400.000	290.000	84.000		30.000	37	2.847.000	All			38	5054	15.866310	All coke produced used for plant furnaces. Gas production evidently 1000 times to great and have so taken it.
Sloss Sheffield Steel & Iron Co																
Semet Solvay Co																Parent Coy. Semet-Solvay Coy. Syracuse Cap. $20.000.000
Tennessee Coal Iron & R.R. Coy																Coke used for metallurgical purposes. Controlled by U.S. Steel Corp.
Central Steel & Coal Coy.																Coke used for Blast furnaces. Operated by Semet Solvay Coy Syracuse
Woodward Iron Coy																Coke used for Blast furnaces.
The Colorado Fuel & Iron Coy.		2.963482	7.597.680	456447	110.517.		96360.		3.588.275				46			Coke used for Blast furnaces. 6 months output.
The By-Product Coke Corp.																Operated by Semet Solvay Coy.
Wisconsin Steel Coy.																88 Wilpulte ovens under construction.
Coal Products Manufacturing Coy.									1650							
Illinois Steel Coy																Controlled by U.S. Steel Corp. Metallurgical coke made
North Shore Gas Coy.	24160.	417330.	134160.						355					1858	14.776	Controlled by Chicago Gas & Electric Coy.
Illinois Steel Coy.																Controlled by U.S. Steel Corp.
By Product Coke Corp.																
Inland Steel Coy.	599.233	6.740.859.	16.401891.	1.113.685.	247296.		103.784.	121	8609	All			45	4609	14366	
Citizens Gas Coy.		2.801.582.	1.600.635						3841				50			
"		1.921.848.	1.339.867.	469.787.	145.199	7713	41943	30	2482				36			Also 40 Wilputte ovens.
Central Indiana Gas Coy.	25.200	360.000	180.000						360.000					1145	14.285714	Controlled by Metropolitan Gas & Electric Coy. Klonne ovens used. [Gas production evidently 1000 times to great]
Indiana Coke & Gas Coy.	108.000	1.144.911	769074	260.000	50.000	11,000	4000	20					70	4800		Includes 30 Gas Machinery Coy. By-Product Coke Ovens. Gas sold to Citizens Gas Coy Terre Haute. Gas not given
Kentucky Solvay Coke Coy.																
Bethlehem Steel Coy.	738913	7.009.127.	20.193.436.					28	11.822.	All			49·8	4105	15988	180 Koppers ovens under construction.
New England Fuel & Transportation Coy									2.845.							
Detroit City Gas Coy.																Operated by Semet Solvay Coy Syracuse.
Ford Motor Coy.																
Semet-Solvay Coy.																Parent Coy Semet Solvay Coy. Syracuse.
Minnesota Steel Coy.																Controlled by U.S. Steel Corp.
Zenith Furnace Coy.	121250.	1.512.000.	822.000.						705	All			50	1865	5805	Evidently an error in either quantity of coke or gas or both.
Minnesota By-Product Coke Coy.																Controlled by Pittsburg By Product Coke Coy.
Laclede Gas Light Coy									2032							
Camden Coke Coy.																
Seaboard By-Product Coke Coy.		4000.000.	5.000.000.	670.000	131.300.		167.000.		2222.				45			Controlled by Pittsburg By Product Coke Coy. 5 months output
Donner Union Coke Corp.																Controlled by Donner Steel Coy.
Semet-Solvay Coy.																
Empire Coke Coy.	112572.	1.539108.	2.597.154	232.259					579				55	2447	5143	Parent Coy. Semet Solvay Coy Syracuse. Evidently a mistake in coke or gas or both.
Lackawanna Steel Coy.																Coke used for Blast Furnaces. Includes 282 Rothburg ovens.
Semet-Solvay Coy.																
Dover Coke & By-Product Coy.		10	20	2	·7	·3	·5		10				45			Controlled by M.A. Hanna Coy. Roberts Flueless ovens.
United Furnace Coy.	231981.	2.672.039	7.540.157	648957.	123664.		36491.	115	3043				45	4934	13204	
American Steel & Wire Coy.																Controlled by U.S. Steel Corp.
Cleveland Furnace Coy.																Operated by Semet Solvay Coy.
Domestic Coke Corp.																
McKinney Steel Coy.	848260	10.950.000	29.200000.	2.372.500.	438.000.		182.600	187	12775	811760.	36500.		45	4158	15060	12.000.000 cu ft is evidently 12.775.000.000 and have accepted the latter.
Hamilton Otto Coke Coy.													60			Not operating
Ironton Solvay Coke Coy.																
National Tube Coy.																Controlled by U.S. Steel Corp.
Portsmouth Solvay Coke Coy.																
La Belle Iron Works.	426423.	5.057.640.	14.107.113.	801.112	248122.		112000.		6436.	386242.	27546.	12455	36	4536	15093	Coke used in Blast Furnace. Evidently the gas is 1000 times to great. Corrected accordingly
Toledo Furnace Coy.	405.605	5.169.000	14.985460	1.176.762	247350.		44.679		6253				47	4315	15419	Controlled by Pickands Mather & Coy.
Brier Hill Steel Coy.										All			40			
Youngstown Sheet & Tube Coy.	1250.000.	14.454.000.	39.750000.						20.777.					4085	16622	Coke used for Blast Furnaces
Philadelphia Suburban Gas & Electric Co										All			45			Coke used for Blast Furnaces.
Carnegie Steel Coy.																Controlled by U.S. Steel Corp. also 128 ovens under construction.
Semet-Solvay Coy.																Operated by Semet-Solvay Coy.
Carnegie Steel Coy.																
Cambrai Steel Coy.		8.599.650.	7.067.560.	585.267.	224.209.	25100	90684.		18879.				54			Controlled by Midvale Steel & Ordnance Coy.
Bethlehem Steel Coy.													40			Coke used in Blast Furnaces.
Alleghany By-Product Coke Coy.																
Pittsburg Crucible Steel Coy.																
Jones & Laughlin Steel Coy.	1.300.000.	16.000.000	50.000000.	6.000.000.					12					4333		Estimated Production. Evidently some mistake. not taken for gas per ton
Lehigh Coke Coy.																Includes 150 Didier ovens. 212 extra ovens under construction.
Bethlehem Steel Coy.																Cap. stock owned by Bethlehem Steel Coy.
Rainey Wood Coke Coy.																
Providence Gas Coy.																
Chattanooga Coke & Gas Coy.	110.000	900.000.	2.400.000						480					4583	4364	Est. Gas sold to Chattanooga Gas Coy for Domestic use
Seattle Lighting Coy.	33.500	337.000							46					2675	1391	Klonne ovens used. Evidently a mistake
Domestic Coke Corp.																
North Western Iron Coy.	253380.	2.395.328	6.132.055	448.098.	122.752.		32308.		3.685.519					2347	14549	Gas given evidently 1000 times too great.
Milwaukee Coke & Gas Coy.	823.204.	6.877.389.	21.057.043					1122	9836				71	5145	11948	
CANADA																
Dominion Iron & Steel Coy.	471033.	5.060.682.	11.320.108.	93489.	144496.	28929.	8106.	22	1.656.425.	All			60			
"																
The Steel Coy of Canada Ltd.													55			Wilputte ovens.
Algoma Steel Corp Ltd	408033.	2.636.753.	9.730.023						2.524				40			Controlled By Lake Superior Corp.
"																

Wm Pearce Febr 12th 1920

Koppers is no doubt now the favourite oven and will base calculations on it. Rejecting Central Indiana Gas Co of Muncie Ind. and the Seattle Lighting Coy of Seattle which two differ so much from the average that they should be rejected. the average of the balance is 4491 tons of coke per oven per annum.

For Gas per ton of Coke in Koppers ovens rejecting for reasons given. Central Indiania Gas Co of Muncie Indiana and the Seattle Lighting Co. The balance average 15.202. cu ft. of gas per ton of Coke.

GRAPH 49

TO ACCOMPANY GRAPH OR SCHEDULE NO. 48

BY-PRODUCT OVENS.

From five tests made by the Officials of the Calgary Power Plant to determine the relative values of coal and natural gas as supplied in Calgary, it would appear that 16,780 cu.ft. of Gas is equal to one ton of coal and that was arrived at after rejecting two tests which gave results very much below the average. The coals used by the Power Plant were high grade lignites and for ordinary steam purposes, probably about as good as Bituminous, provided the boilers are adapted to burn it.

A very reliable party claims from thorough tests that one ton of good Bituminous Coal from Crow's Nest Pass utilized under the best conditions is equivalent to 25,600 cu.ft. of Calgary Natural Gas.

The mean of the two is 21,190. Have adopted 21,200 cu.ft. Calgary Natural Gas as equivalent to one ton of mine run of good Bituminous Coal in Crow's Nest Pass and think in ordinary practice it will be found such will closely be approximate.

The following calculations are based on coking coals from the said field.

Average No. of tons of coke per oven per annum as per schedule is 4,491 say 4,500.

Average No. of cu.ft. of gas per ton of coke 15,202 or 10,641 per ton of coal. To be conservative assume 10,000 cu.ft. of gas per ton of coal.

Average No. of hours coking 17.7
% of Coke 70.94
Average Charge 12.56 tons, after rejecting Central Indiana Gas Co. and Seattle Lighting Co.

Will assume 18 hours for coking, 70% coke and 12 tons oven charge. On that basis each oven would turn out 4,600 tons Coke per annum; the average as per schedule is 4,491 say 4,500. 70% of 15,202 equals 10,604 equals No.cu.ft. of Gas per ton of Coal as per schedule. For purposes of this will adopt 10,000 cu.ft.

By-product oven gas at 600 B.T.U. and Natural Gas at 960 B.T.U.'s, then By-product oven gas is worth 62.5% of Natural Gas.

21,190 cu.ft. of gas at 960 B.T.U.'s equals 33,900 of By-product Gas at 600 B.T.U.'s equals one ton good steam coal.

In good practice in By-product ovens not more than 40% of the gas produced is required to heat the ovens. Where gas is of good value they can be heated by means of producer gas for one half the cost. So it follows that after providing for heating the ovens, 80% of the value of the gas is available to be credited as receipts therefrom.

If one ton coal produces 10,000 cu.ft. gas, 80% of that is 8,000. 8,000 is 23.6% of 33,900. In other words 23.6% of the cost of the coal is met with in the gas obtained in coking it.

Placing coal in Crow's Nest Pass at $3.75 per ton for mine run. Freight $2.00. In addition the cost of handling coal in a power house above that of gas to perform the same duty is $.916 per ton. $3.75 $2.00 $.916 equals $6.666; 23.6% of that equals $1.57.

At $6.666 per ton, by-product oven gas is worth 19.6 cents Per M.

Motor fuel 2½ gallons per ton at 40¢ per gal. equals	1.00		15%
Sulphate Ammonia 27 lbs. per ton at 2½¢ per lb. equals	67.5		10%
9 gallons per ton of tar at 2½¢	equals	22.5	3.5%

Coal at $5.75 per ton from which are derived:

Gas	1.57 or	27.3% of cost
Motor Spirit	1.00 "	17.4% " "
Ammonia Sulphate	67.5 "	11.7% " "
Tar	22.50 or	3.7% " "
	3.470	60.1%

Operating expenses per ton $.685 say $.70.
Assuming 40 ovens at $50,000 each; (They probably can be built for 80% of that amount) $2,000,000, Interest on cost 8%.
Maintenance and deterioration 4%; total 12% per annum equals $240,000.
40 ovens at 4,500 tons coke per annum, 70% coke, 6,430 tons coal for each or for the 40;257,200 tons for the year or 92.3 cts. per ton for interest.

Operating expenses $.70 Interest $.933, together equals $1.633.

$3.47 - $1.633 equals $1.837 the net receipts over expenses on one ton coal.

Coal at $5.75 leaving net cost of coal at $3.913. Made into Coke at 70% equals $5.59 say $5.60 per ton of coke.

All that coke nets above that price would be profit.

The tar contains a vast number of valuable ingredients; creosote, explosives, dyes and the residue would make binder for briquetting and probably if there was sufficient, an economical road binder. It is worth the value put on it as a fuel. For creosote, briquette binder and possibly road bitumin or binder, Alberta should furnish the very best possible market. As for the dyes and explosives it is possible that other points might be better located.

In addition if the location of the By-product oven plant is well adapted as a location for a briquetting plant, to combine the two would add very materially to profits of both.

If the by-product oven plant is on the route or approximately on it from the Source of Supply of Bituminous coals to where the coke is to be disposed that would seem to be a good location for it. If, in addition said location is en route or approximately on it from coals suitable for briquetting to where the briquettes are to be sold, such situation would appear to be the most suitable.

The amounts and values of Sulphate and Tar, also amount of Motor Spirit are taken from Mr. Lucas' Report Page 79 of the Final Report of the Fuel Comptroller of Canada, March 1919.

Calgary, Alberta,
3rd March, 1920

File 318.

Dear Sir:

I am enclosing you herewith under separate cover two blueprints regarding by-product ovens and their output graphs Nos. 48 and 49.

There is no doubt whatever that by obtaining stoves designed for the utilization of coke that such coke would wholly displace Anthracite Coal and further take the place largely of other coals particularly in those portions of the country where the transportation from the mine to the point of consumption is a considerable percentage of the total cost.

The stoves at present used to burn Anthracite will burn Coke equally as well if the draughts are properly arranged. One must bear in mind however that the cubical contents of one ton of Coke is practically double that of Anthracite. It has, probably in many cases, more heat units than Anthracite and under good firing a less percentage not converted into heat.

If the purchase of stoves or furnaces suitable for burning Anthracite was to cease at once a very large demand would occur for a substitute for same and in a very few years those now in use would become worthless. It therefore follows that the coking interests and the stove making interests should get together in the way of furnishing an article suitable for burning coke.

It is probably not a rash prophecy to state that there might within the next five years be one million tons of coke used in Canadian points West of Lake Superior furnished from Alberta or British Columbia Bituminous Coals.

The consumption of Anthracite in Manitoba and Saskatchewan in round numbers for 1917 was 500,000 tons. It therefore would seem probable that within that period (five years) the demand for coke would require 220 ovens of the kind discussed to supply same.

1,000,000 tons of Coke would furnish by-product oven gas to the amount of 15,202,000,000 cu.ft. or 9,501,250,000 cu.ft. of the quality of Calgary Natural Gas

The higher the grade of fuel Alberta can produce the further said fuels can be profitably shipped. Do not coke and briquettes best fill the bill in that regard?

According to the Annual Report of Canadian Western Natural Gas, Light, Heat and Power Company dated 30th September 1915, Calgary took for the year ending that date 3,535,025,000 cu.ft. of Natural Gas which is 37.2% of what 220 ovens would produce. 37.2% of 220 equals 81.84 No. of ovens required to produce the Gas Calgary consumed in said year.

Is not this a subject which should be thoroughly looked into?

I would take as a personal favor if you would make a rigid examination of the data presented and point out any errors or if too high an estimate has been made of the by-products or any matter which suggests itself.

It is of course to be distinctly understood that though I am an official of the Canadian Pacific Railway, that Corporation is not directly or indirectly connected with the matter presented in this.

Respectfully submitted,
WM. PEARCE.

.....

NOTE: The use of coal finely pulverized and dehydrated is rapidly being extended and in the near future will occupy a prominent position in the supply of heat. Such use is particularly advantageous in the matter of lignites and will probably supplant American Coals to a large extent in Manitoba, and while the results will prove of vast economic benefit it will not extend the field for the Alberta product. Such supplanting will be by means of the Saskatchewan Lignites.

GRAPH 49

TO ACCOMPANY GRAPH OR SCHEDULE NO. 48

BY-PRODUCT OVENS.

From five tests made by the Officials of the Calgary Power Plant to determine the relative values of coal and natural gas as supplied in Calgary, it would appear that 16,780 cu.ft. of Gas is equal to one ton of coal and that was arrived at after rejecting two tests which gave results very much below the average. The coals used by the Power Plant were high grade lignites and for ordinary steam purposes, probably about as good as Bituminous, provided the boilers are adapted to burn it.

A very reliable party claims from thorough tests that one ton of good Bituminous Coal from Crow's Nest Pass utilized under the best conditions is equivalent to 25,600 cu.ft. of Calgary Natural Gas.

The mean of the two is 21,190. Have adopted 21,200 cu.ft. Calgary Natural Gas as equivalent to one ton of mine run of good Bituminous Coal in Crow's Nest Pass and think in ordinary practice it will be found such will closely be approximate.

The following calculations are based on coking coals from the said field.

Average No. of tons of coke per oven per annum as per schedule is 4,491 say 4,500.

Average No. of cu.ft. of gas per ton of coke 15,202 or 10,641 per ton of coal. To be conservative assume 10,000 cu.ft. of gas per ton of coal.

Average No. of hours coking 17.7
% of Coke 70.94
Average Charge 12.56 tons, after rejecting Central Indiana Gas Co. and Seattle Lighting Co.

Will assume 18 hours for coking, 70% coke and 12 tons oven charge. On that basis each oven would turn out 4,600 tons Coke per annum; the average as per schedule is 4,491 say 4,500. 70% of 15,202 equals 10,604 equals No.cu.ft. of Gas per ton of Coal as per schedule. For purposes of this will adopt 10,000 cu.ft.

By-product oven gas at 600 B.T.U. and Natural Gas at 960 B.T.U.'s, then By-product oven gas is worth 62.5% of Natural Gas.

21,190 cu.ft. of gas at 960 B.T.U.'s equals 33,900 of By-product Gas at 600 B.T.U.'s equals one ton good steam coal.

In good practice in By-product ovens not more than 40% of the gas produced is required to heat the ovens. Where gas is of good value they can be heated by means of producer gas for one half the cost. So it follows that after providing for heating the ovens, 80% of the value of the gas is available to be credited as receipts therefrom.

If one ton coal produces 10,000 cu.ft. gas, 80% of that is 8,000. 8,000 is 23.6% of 33,900. In other words 23.6% of the cost of the coal is met with in the gas obtained in coking it.

Placing coal in Crow's Nest Pass at $3.75 per ton for mine run. Freight $2.00. In addition the cost of handling coal in a power house above that of gas to perform the same duty is $.916 per ton. $3.75 $2.00 $.916 equals $6.666; 23.6% of that equals $1.57.

At $6.666 per ton, by-product oven gas is worth 19.6 cents Per M.

Motor fuel 2½ gallons per ton at 40¢ per gal.	equals	1.00	15%
Sulphate Ammonia 27 lbs. per ton at 2½¢ per lb.	equals	67.5	10%
9 gallons per ton of tar at 2½¢	equals	22.5	3.5%

Coal at $5.75 per ton from which are derived:

Gas	1.57 or	27.3% of cost
Motor Spirit	1.00 "	17.4% " "
Ammonia Sulphate	67.5 "	11.7% " "
Tar	22.50 or	3.7% " "
	3.470	60.1%

Will assume 18 hours for coking, 70% coke and 12 tons oven charge. On that basis each oven would turn out 4,600 tons Coke per annum; the average as per schedule is 4,491 say 4,500. 70% of 15,202 equals 10,604 equals No.cu.ft. of Gas per ton of Coal as per schedule. For purposes of this will adopt 10,000 cu.ft.

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Tar	22.50 or	3.7% " "
	3.470	60.1%

Operating expenses per ton $.685 say $.70.
Assuming 40 ovens at $50,000 each; (They probably can be built for 80% of that amount) $2,000,000, Interest on cost 8%.
Maintenance and deterioration 4%; total 12% per annum equals $240,000.
40 ovens at 4,500 tons coke per annum, 70% coke, 6,430 tons coal for each or for the 40;257,200 tons for the year or 93.3 cts. per ton for interest.

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The amounts and values of Sulphate and Tar, also amount of Motor Spirit are taken from Mr. Lucas' Report Page 79 of the Final Report of the Fuel Comptroller of Canada, March 1919.

BY-PRODUC

Athority - Browns Directory of American Gas Companies Gas Statistics 1919. Progressive Age Publishing Co. 52. Vanderbilt Ave New York.
This embraces practically all the By Product Coke oven plants in U.S. and Canada shown in said Authority and being operated.

In 1909 in the U.S. Beehive ovens produced 84·09% and By Product ovens 15·91% of the total Coke production 39.305.015 Tons. In 1918 53·7% and 43·3%

For metallurgical purposes a higher grade of coke is required than for Domestic. In other wo

Page	State or Country	Town or City	Name of Company	Capital including Bonds	Koppers Ovens							Semet-Solvay Ovens							Otto Hoffman Ovens						
					No of Ovens	Size Length x width x Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas	Candle Power	No of Ovens	Size Length x Width x Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas	Candle Power	No of Ovens	Size Length x Width x Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas
445	Alabama	Alabama City	Gulf States Steel Co	$ 11.000.000	37	37'x17'-19½"x 9'-10"	12·25	17	78	525														
"	"	Birmingham	Sloss Sheffield Steel & Iron Co	$ 20.000.000																				
"	"	Ensley	Semet Solvay Co									120	Under construction											
"	"	Fairfield	Tennessee Coal Iron & R.R. Coy	$ 6.772.000	280	37'8"x19'9"x 9'10"	12·5					240	30'x16½"x 4'9"-6'9"											
"	"	Holt	Central Steel & Coal Coy.									60	35'x16½"-20"x 8'2"											
"	"	Woodward	Woodward Iron Coy		170	also 60 Wilputte ovens																		
446	Colorado	Pueblo	The Colorado Fuel & Iron Coy.	$ 91.200.000	120	40'x18"x10"	13	18	67·6	587														
"	Illinois	Chicago	The By-Product Coke Corp.																					
"	"	"	Wisconsin Steel Coy.	$ 1.000.000								280	36'x16½"-19"x8'2"-9'6"											
"	"	Joliet	Coal Products Manufacturing Coy.	$ 1.143.000	35	35'x18"x9'	also 18 Wilputte ovens																	
"	"	"	Illinois Steel Coy	$ 18.500000	280	35'x19"x 8'9"	10·5																	
447	"	Waukegan	North Shore Gas Coy.	$ 8.000.000								13	20'x 19'x 9'	8·5	22	565	20							
"	Indiana	Gary.	Illinois Steel Coy.		700	37'x19"x 9'10⅜"	12·5																	
"	"	Indiana Harbour	By Product Coke Corp.	$ 12.000.000								120	36'x 19½"x 10'9½"	under construction.										
"	"	"	Inland Steel Coy.	$ 36.000.000.	130	37'x18½"-21"x9'10⅜"	13·25	18	72	525														
"	"	Indianapolis	Citizens Gas Coy.	$ 12.000.000.															100	7·9" long.	7·5	24		617
"	"	"	"	"								41	36'x19½"x12'	15	24	80	579	8						
448	"	Muncie	Central Indiana Gas Coy.	$ 8.500.000	22	19'x 20"x 7'	5	24	70	580														
"	"	Terra Haut.	Indiana Coke & Gas Coy.	$ 3.175.000	60	37'4⅛"x15'-17"x11'9¼"	13	17	65	525														
"	Kentucky	Ashland	Kentucky Solvay Coke Coy.	$ 5.200.000								108	36'x21"x12'											
449	Maryland	Sparrows Point	Bethlehem Steel Coy.	$ 365.000.000	180	37'x18½"-21"x9'10⅜"	13·5	18	70															
"	Massachusetts	Boston.	New England Fuel & Transportation Coy	$ 25.000.000.																				
"	Michigan	Detroit.	Detroit City Gas Coy.	$ 31.000.000															400	33'x18"x6'				
"	"	"	Ford Motor Coy.									215												
"	"	"	Semet-Solvay Coy.									120	under construction.											
"	Minnesota	Duluth.	Minnesota Steel Coy.		90							215	30·36'x16'-20"x 8'2"-10'9											
450	"	"	Zenith Furnace Coy.	$ 1.500.000																				
"	"	St. Paul.	Minnesota By-Product Coke Coy.	$ 3.000.000	65	39'6"x18¼"x 9'10⅞"	12·25	17	72	530	14								65	33'x17½"x 6'6"		20	70	450
"	Missouri	St Louis	Luclede Gas Light Coy	$ 28.000.000	56	37'6"x19½"x 9'10"	13·25	18																
"	New Jersey	Camden	Camden Coke Coy.	$ 350.000.															150					
"	"	Jersey City	Seaboard By-Product Coke Coy.																165	39'6"x18¼"x 9'10⅝"	12·5	17	72	520
451	New York	Buffalo	Donner Union Coke Corp.		150	40'x15¾"-18¼"x 10'	11·7	14	70	under construction														
"	"	"	Semet-Solvay Coy.									60	36'x19½"x 10'9"											
"	"	Geneva	Empire Coke Coy.	$ 1.750.000								46	35'x16"x 7'4"-8'11"	84	21	72	590							
"	"	Lackawanna	Lackawanna Steel Coy.	$ 56.900.000								60	under construction.						470	32'2½"x 15⅞"x 6'4"				

ing Co. 52. Vanderbilt Ave New York.
n in said Authority and being operated.

BY-PRODUCT COKE OVENS.

Owing to investments and location of Beehive oven
wholly By-Product. When By-Product oven ga
thereby affecting very considerable econom

By Product ovens 15·91% of the total Coke production 39,305,015 Tons. In 1918 53·7% and 43·3% respectively of the total tonnage 56,670,000 Tons. Increase in Total coke tonnage 1909-1918. 44·2%. Decrease in B

allurgical purposes a higher grade of coke is required than for Domestic. In other words coals make Domestic coke which would not make metallurgical

		Semet-Solvay Ovens							Otto Hoffman Ovens							Coals		By-Products									Coke Clas	
B.T.U's of Gas	Candle Power	No of Ovens	Size Length x Width x Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas	Candle Power	No of Ovens	Size Length x Width x Height	Charge in Tons	Hours for Coking	Percentage Coke Produced	B.T.U's of Gas	Candle Power	High Volatile Percentage	Low Volatile Percentage	Coke in Tons	Tar in Gals.	Ammonia Sulphate in lbs.	Pure Benzol in gals	Pure Tuluol in gals.	Xylol in gals	Solvent Naphtha in gals	Naphthalene in Tons	Gas M. Cu. ft.	Blast Furnace Tons	
525																18	82	187.000	1,920,000.	5.400.000	290.000	84,000		30.000	37	2.847.000	All	
		120	Under construction																									
		240	30'x16½"x4'9"-6'9"																									
		60	35'x16½"-20"x8'2"																									
587																100			2.963482	7.597.680	456447	110.517.		96360.		3.588.275		
		280	36'x16½"-19'x8'2"-9'9"																									
ens																										1650		
		13	20'x19'x9'	8·5	22	565	20											24160.	417330.	134.160.						355		
		120	36'x19½"x10'9½" under construction.																									
525																70	30	599.233	6.740.859.	16.401.891.	1.113.685.	247.296.		103.784.	121	8609	All	
									100	7·9" long.	7·5	24		617	9				2.801.582.	1.600.635						3841		
		41	36'x19½"x12'	15	24	80	579	8											1.921.848.	1.339.867.	469.787.	145.199	7713	41943	30	2482		
580																100		25.200	360.000	180.000						360.000		
525																90	10	108.000	1.144.911	769074	260.000	50.000	11.000	4000	20			
		108	36'x21"x12'																									
																50	50	738913	7.009.127.	20.193.436.					28	11.822.	All	
									400	33'x18"x6'					18											2.845.		
		215																										
		120	under construction.																									
		215	30·36'x16'·20"x8'2"-10·9																									
									65	33'x17½"x6'6"		20	70	450	16	100		121,250.	1.512.000.	822,000.						705	All	
530	14															80	20											
									150																	2032		
									165	39·6"x18¼"x9'10⅝"	12·5	17	72	520	13·5	80	20		4000.000.	5.000.000.	670.000	131300.		167.000.		2222.		
under construction																												
		60	36'x19½"x10'9"																									
		46	35'x16"x7'4"-8'11"	84	21	72	590									50	50	112.572.	1.539.108.	2.597.154	232.259					579		
		60	under construction						470	32·21¼"x15⅞"x6'4"																		

OVENS.

Owing to investments and location of Beehive oven plants they will only gradually decrease. otherwise the output would soon be wholly By-Product. When By-Product oven gas is in demand, Producer gas can readily be substituted for heating ovens thereby affecting very considerable economy.

tal tonnage 56.670.000 Tons. Increase in total coke tonnage 1909-1918. 44·2%. Decrease in Beehive 8·1%. Increase in By-Product 319·9%.

estic coke which would not make metallurgical

By-Products									Coke Classification			Percentage of Gas used in heating Ovens	Tons of Coke per Oven per Annum	Cu feet of Gas per Ton of Coke	Remarks.
	Tar in Gals.	Ammonia Sulphate in lbs.	Pure Benzol in gals	Pure Tuluol in gals.	Xylol in gals	Solvent Naphtha in gals	Naphthalene in Tons	Gas M. Cu.ft.	Blast Furnace Tons	Breeze Tons	Other Purposes Tons				
7.000	1.920,000.	5.400.000	290.000	84.000		30.000	37	2.847.000	All			38	5054	15.8663/0	All coke produced used for plant furnaces. Gas production evidently 1000 times too great and have so taken it:
															Parent Coy. Semet-Solvay Coy. Syracuse Cap. $20.000.000
															Coke used for metallurgical purposes. Controlled by U.S. Steel Corp.
															Coke used For Blast Furnaces. Operated by Semet Solvay Coy Syracuse
															Coke used For Blast Furnaces.
	2.963482	7.597.680	456447	110.517.		96360.		3.588.275				46			Coke used For Blast Furnaces. 6 months output.
															Operated by Semet Solvay Coy.
															88 wilputte ovens under construction.
								1650							
															Controlled by U.S. Steel Corp. Metallurgical cokemade
60.	417330.	134.160.						355					1858	14.776	Controlled by Chicago Gas & Electric Coy.
															Controlled by U.S. Steel Corp.
233	6.740.859.	16.401891.	1.113.685.	247.296.		103.784.	121	8609	All			45	4609	14366	
	2.801.582.	1.600.635						3841				50			
	1.921.848.	1.339.867.	469.787.	145.199	7713	41943	30	2482				36			Also 40 Wilputte ovens. Gas production evidently 1000 times too great
00	360.000	180.000						360.000					1145	14.285714	Controlled by Metropolitan Gas & Electric Coy. Klonne ovens used.
000	1.144.911	769074	260.000	50.000	11.000	4000	20					70	4800		Includes 30 Gas Machinery Coy. By-Product Coke Ovens. Gas not given Coke sold to Chicago Gas Coke & Chemical Co. Gary, Terre Haute
							28	11.822.	All			49·8	4105	15 988	180 Koppers ovens under construction.
913	7.009.127.	20.193.436.						2.845.							
															Operated by Semet Solvay Coy Syracuse.
															Parent Coy Semet Solvay Coy. Syracuse.
															Controlled by U.S. Steel Corp.
50.	1.512.000.	822.000.						705	All			50	1865	5805	Evidently an error in either quantity of Coke or gas or both.
															Controlled by Pittsburg By Product Coke Coy.
								2032							
	4000.000.	5.000.000.	670.000	131300.		167.000.		2222.				45			Controlled by Pittsburg By. Product Coke Coy. 5 months output
															Controlled by Donner Steel Coy.
72.	1.539.108.	2.597.154	232.259					579				55	2447	5143	Parent Coy. Semet Solvay Coy Syracuse Evidently a mistake in Coke or gas or both.
															Coke used For Blast Furnaces. Includes 282 Rothburg ovens.

	4000.000.	5.000.000.	670.000	131.300.		167.000.		2222.				45			Controlled by Pittsburg By. Product Coke Coy. 5 months output		
															Controlled by Donner Steel Coy.		
2572.	1.539.108.	2.597.154	232.259					579				55	2447	5143	Parent Coy. Semet-Solvay Coy Syracuse Evidently a mistake in Coke or gas or both.		
															Coke used for Blast Furnaces. Includes 282 Rothburg ovens.		
	10	20	2	.7	.3	.5		10				45			Controlled by M.A. Hanna Coy. Roberts Flueless ovens.		
231981.	2.672.039	7.540.157	648957.	123664.		36491.	115	3043				45	4934	13204			
															Controlled by U.S. Steel Corp.		
															Operated by Semet Solvay Coy.		
48260	10.950.000	29.200.000.	2.372.500.	438.000.		182.600	187	12775	811760.	36500.		45	4158	15060	12.000.000 cu ft is evidently 12.775.000.000 and have accepted the latter.		
												60			Not operating		
															Controlled by U.S. Steel Corp.		
26423.	5.057.640.	14.107.113.	801.112	248122.		112.000.		6436.	386242.	27546	12455	36	4536	15093	Coke used in Blast Furnace. Evidently the gas is 1000 times too great. Corrected accordingly		
5.605	5.169.000	14.985460	1.176.762	247350.		44.679		6253				47	4315	15419	Controlled by Pickands Mather & Coy.		
									All			40					
50.000.	14.454.000.	39.750.000.						20.777.					4085	16622	Coke used for Blast Furnaces		
									All			45			Coke used for Blast Furnaces.		
															Controlled by U.S. Steel Corp. also 128 ovens under construction.		
															Operated by Semet-Solvay Coy.		
	8.599.650.	7.067.560.	585.267.	224.209.	25100	90684.		18879.				54			Controlled by Midvale Steel & Ordnance Coy.		
												40			Coke used in Blast Furnaces.		
0.000.	16.000.000	50.000.000.	6.000.000.					12					4333		Estimated Production. Evidently some mistake. not taken for gas per ton.		
															Includes 150 Didier ovens. 212 extra ovens under construction.		
															Cap. stock owned by Bethlehem Steel Coy.		
000	900.000.	2.400.000						480					4583	4364	Est. Gas sold to Chattanooga Gas Coy for Domestic use		
.500	337.000							46					2675	1391	Klonne ovens used. Evidently a mistake		
3380.	2.395.328	6.132.055	448.098.	122.752.		32308.		3.685.519					2347	14549	Gas given evidently 1000 times too great.		
3.204.	6.877.389.	21.057.043					1122	9836				71	5145	11948			
033.	5.060.682.	11.320.108.	93.489.	144.496.	28929.	8106.	22	1.656.425.	All			60					
												55			Wilputte ovens.		
3033.	2.636.753.	9.730.023						2.524				40			Controlled By Lake Superior Corp.		
are	combined																

Wm Pearce Febr 7th 1920

that they should be rejected. the average of the balance is 4491 tons of coke per oven per annum.

For Gas per ton of Coke in Koppers ovens rejecting for reasons given. Central Indiania Gas Co of Muncie, Indiana and The Seattle Lighting Co. The balance average 15.202. cu ft. of gas per ton of Coke.

									165	39·6'×18¼"×9'·10⅝"	12·5	17	72	520	13·5	80	20		4000.000.	5.000.000.	670.000	131.300.		167.000.		2222.		
under construction																												
		60	36'×19½"×10'·9"																									
		46	35'×16"×7'4"–8'11"	84	21	72	590									50	50	112.572.	1.539.108.	2.597.154	232.259					579		
		60	under construction.						470	32'·2¼"×15⅞"×6'·4"																		
		40	30'×16½"×6'·7"																									
520																100			10	20	2	·7	·3	·5		10		
539																80	20	231.981.	2.672.039	7.540.157	648.957.	123.664.		36.491.	115	3043		
		100	34'·6"×16"–20"×8'·2"																									
		60	under construction																									
520																85	15	848260	10.950.000	29.200.000.	2.372.500.	438.000.		182.600	187	12775	811.760.	365
									100		6·75	24	72	685	15	80	20											
		60	36'×21"×12'																									
		108	36'×21"×12'																									
574																85	15	426.423.	5.057.640.	14.107.113.	801.112	248.122.		112.000.		6436.	386.242.	275
527																85	15	405.605	5.169.000	14.985460	1.176.762	247.350.		44.679		6253		
																80	20										All	
																		1.250.000.	14.454.000.	39.750.000.						20.777.		
		40	30'×15"×8'	7·5	21	75	570	5																			All	
		110	30'×16½"×4'·9"–6'·9"																									
									212	43'·9"×17¼"×7'	9·5																	
									552	32'×17"–19"×6'·10⅝"–9'·10"	9·7–12·5	21	70	520		30	70		8.599.650.	7.067.560.	585.267.	224.209.	25100	90.684.		18.879.		
									229	33'×17"–22"×6'·5"	6	34	70	600	17	67	33											
									120	33'·3"×16"×6'·6"	6		72·5															
																		1.300.000.	16.000.000	50.000.000.	6.000.000.					12		
00																												
		120																										
nstruction.																												
		24		16	[illegible]	72	625	17										110.000	900.000.	2.400.000						480		
07																		33.500	337.000							46		
ction																												
									108		9·12	19	75			71	29	253.380.	2.395.328	6.132.055	448.098.	122.752.		32.308.		3.685.519		
		160	35'×16½"×9'·6"	9·99	1[illegible]·5	82	610											823.204.	6.877.389.	21.057.043					1122	9836		
										CANADA																		
									620	33'–34'×14"–17"×6'–9"	5·5–9·4	26–38	66·7	615		100		471.033.	5.060.682.	11.320.108.	93.489.	144.496.	28.929.	8.106.	22	1.656.425.	All	
615																												
	Wilputte ovens																											
																60	40	408.033.	2.636.753.	9.730.023						2.524		
Wilputte ovens																60	40											
		2520							3291	Wilputte ovens 105. Otto United & otto Hoffman are combined																		
		22·1%							28·9%	Wilputte 0·9%																		

ral Indiana Gas Co of Muncie Ind. and the Seattle Lighting Coy of Seattle which two differ so much from the average that they should be rejected. The average of the balance is 4491 tons of coke per oven per annum.

-	New Jersey	Camden	Camden Coke Coy.	$ 350.000.															150						
"	"	Jersey City	Seaboard By-Product Coke Coy.																165	39'6"x18¼"x9'10⅝"	12.5	17	72	520	13.5
451	New York	Buffalo	Donner Union Coke Corp.		150	40'x15½"-18½"x10'	11.7	14	70	under construction															
"	"	"	Semet-Solvay Coy.									60	36'x19½"x10'9"												
"	"	Geneva	Empire Coke Coy.	$1.750.000								46	35'x16"x7'4"-8'11"	84	21	72	590								
-		Lackawanna	Lackawanna Steel Coy.	$36.900.000								60	under construction.						470	32'2¼"x13⅝"x6'4"					
452	"	Syracuse	Semet-Solvay Coy.	$20.000.000								40	30'x16½"x6'7"												
-	Ohio	Canal Dover	Dover Coke & By-Product Coy.		24	41'x14"x13'7"	15	14	68	520															
-	"	Canton	United Furnace Coy.	$ 2.500.000	47	37'x17"-19½"x9'10"	12.7	15	73	539															
"	"	Cleveland	American Steel & Wire Coy.	$ 90.000.000	180	37'x18⅛"x9'10⅝"	12.5																		
-	"	"	Cleveland Furnace Coy.									100	34'6"x16"-20"x8'2"												
453	"	-	Domestic Coke Corp.	$3.500.000								60	under construction												
-	-	"	McKinney Steel Coy.		204	37'x18½"x9'10"	12.25	18	73	520															
-	-	Hamilton	Hamilton Otto Coke Coy.																100		6.75	24	72	685	15
"	-	Ironton	Ironton Solvay Coke Coy.	$ 2.000.000.								60	36'x21"x12'												
"	"	Lorain	National Tube Coy.	$ 9.797.000	208	37'x18"x9'10"	12.5																		
"	"	Portsmouth	Portsmouth Solvay Coke Coy.	$ 3.500.000.								108	36'x21"x12'												
454	-	Steubenville	La Belle Iron Works.	$ 12.500.000	94	37'6"x18½"x9'10⅝"	12.53	17	72-78	574															
"	-	Toledo	Toledo Furnace Coy.	$ 7.300.000.	94	37'x17"-19½"x9'10"	12.5	16	73	527															
-	"	Youngstown.	Brier Hill Steel Coy.		84		12.25	17																	
455	"	"	Youngstown Sheet & Tube Coy.	$ 30.000.000	306	39'6"x17"-19½"x9'10⅝"	12.25	18	68																
"	Pennsylvania	Chester	Philadelphia Suburban Gas & Electric Co.									40	30'x15"x8'	7.5	21	75	570	5							
-	"	Clairton.	Carnegie Steel Coy.		640	37'x18½"x9'4½"	13					110	33'x16½"x4'5"-6'9"												
-	"	Dunbar	Semet-Solvay Coy.																						
-	-	Farrell	Carnegie Steel Coy.																212	43'4"x17¼"x7'	9.5				
"	"	Johnstown.	Cambria Steel Coy.																552	32'x17-18"x6'10⅞"-8'6"	9.7-12.8	21	70	520	
456	"	Lebanon	Bethlehem Steel Coy.																229	33'x17-22"x6'5"	6	84	70	600	17
-	-	McKeesport	Allegheny By-Product Coke Coy.																120	33'3"x16"x6'6"	6		72.5		
-	"	Midland	Pittsburg Crucible Steel Coy.		100	under construction																			
"	"	Pittsburg	Jones & Laughlin Steel Coy.		300	under construction																			
"	"	South Bethlehem	Lehigh Coke Coy.		362		13.75		75	500															
"	"	Steelton.	Bethlehem Steel Coy.									120													
-	"	Swedeland	Rainey Wood Coke Coy.		110	39'6"x17"x9'10⅝"	11.7	under construction.																	
"	Rhode Island	Providence	Providence Gas Coy.		40	40'x17"x9'10"	11.4	16																	
457	Tennessee	Chattanooga	Chattanooga Coke & Gas Coy.	$2.275.000								24		16	18	72	625	17							
"	Washington	Seattle	Seattle Lighting Coy.		20	27'x16.5"x7'11"	8.3	25	67	607															
-	West Virginia	Fairmount	Domestic Coke Corp.		60	37'x8.5½"x11.7	under construction																		
-	Wisconsin	Maysville	North Western Iron Coy.																108		9.12	19	75		
"	-	Milwaukee	Milwaukee Coke & Gas Coy.	$3.500.000.								160	36'x16½"x8'6"	9.99	13.5	82	610								
																				C A N A					
458	Nova Scotia	Sydney	Dominion Iron & Steel Coy.	$ 20.640.000															620	33-34'x14"-17"x6'9"	3.5-9.4	26-38	66.7	115	
-	"	"	" "	"	180	37'x17"x9'10"	11.3	18	69.5	615															
-	Ontario	Hamilton	The Steel Coy of Canada Ltd.	$ 25.000.000.	80	38'x16½"-19"x10'5"	12.6	18	76		Wilputte ovens														
-	"	Sault Ste Marie	Algoma Steel Corp Ltd	$ 51.000.000	110	39'x17"-21"x9'10⅝"	12.85	19.5	70																
-	"	"	" " "	"	25	39'5"x18⅝"-21½"x9'10⅝"	12.85	19.5	70	Wilputte ovens															
			Totals		5470							2520							3291	Wilputte ovens 106					Otto Hoff…
			% of the whole		48.1%							22.1%							28.9%	Wilputte 0.9%					

Koppers is no doubt now the favourite oven, and will base calculations on it. Rejecting Central Indiana Gas Co of Muncie Ind, and the Seattle Lighting Coy of Seattle which two differ somewh…

UAA 1974-164-2100-002-017

1748
&
49

Calgary, Alberta,
3rd March, 1920

File 318.

Dear Sir:

I am enclosing you herewith under separate cover two blueprints regarding by-product ovens and their output graphs Nos. 48 and 49.

There is no doubt whatever that by obtaining stoves designed for the utilization of coke that such coke would wholly displace Anthracite Coal and further take the place largely of other coals particularly in those portions of the country where the transportation from the mine to the point of consumption is a considerable percentage of the total cost.

The stoves at present used to burn Anthracite will burn Coke equally as well if the draughts are properly arranged. One must bear in mind however that the cubical contents of one ton of Coke is practically double that of Anthracite. It has, probably in many cases, more heat units than Anthracite and under good firing a less percentage not converted into heat.

If the purchase of stoves or furnaces suitable for burning Anthracite was to cease at once a very large demand would occur for a substitute for same and in a very few years those now in use would become worthless. It therefore follows that the coking interests and the stove making interests should get together in the way of furnishing an article suitable for burning coke.

It is probably not a rash prophecy to state that there might within the next five years be one million tons of coke used in Canadian points West of Lake Superior furnished from Alberta or British Columbia Bituminous Coals.

The consumption of Anthracite in Manitoba and Saskatchewan in round numbers for 1917 was 500,000 tons. It therefore would seem probable that within that period (five years) the demand for coke would require 220 ovens of the kind discussed to supply same.

1,000,000 tons of Coke would furnish by-product oven gas to the amount of 15,202,000,000 cu.ft. or 9,501,250,000 cu.ft. of the quality of Calgary Natural Gas

The higher the grade of fuel Alberta can produce the further said fuels can be profitably shipped. Do not coke and briquettes best fill the bill in that regard?

According to the Annual Report of Canadian Western Natural Gas, Light, Heat and Power Company dated 30th September 1915, Calgary took for the year ending that date 3,535,025,000 cu.ft. of Natural Gas which is 37.2% of what 220 ovens would produce. 37.2% of 220 equals 81.84 No. of ovens required to produce the Gas Calgary consumed in said year.

Is not this a subject which should be thoroughly looked into?

I would take as a personal favor if you would make a rigid examination of the data presented and point out any errors or if too high an estimate has been made of the by-products or any matter which suggests itself.

It is of course to be distinctly understood that though I am an official of the Canadian Pacific Railway, that Corporation is not directly or indirectly connected with the matter presented in this.

Respectfully submitted,
WM. PEARCE.

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NOTE: The use of coal finely pulverized and dehydrated is rapidly being extended and in the near future will occupy a prominent position in the supply of heat. Such use is particularly advantageous in the matter of lignites and will probably supplant American Coals to a large extent in Manitoba, and while the results will prove of vast economic benefit it will not extend the field for the Alberta product. Such supplanting will be by means of the Saskatchewan Lignites.

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